

REMARKS

Claims 1-7 and 9-36 are pending in the application and stand rejected.

Rejection of Claims 18, 19 under 35 USC §103(a) over Smith and Barber

Claims 18 and 19 stand rejected for obviousness over the Smith patent (U.S. Patent No. 4,802,143) in combination with U.S. Patent No. 6,091,668, issued to Barber. The Examiner contends that Smith teaches all of the elements of claim 18, including that of determining a subsurface characteristic of a formation from detection of seismic energy imparted into the formation. Specifically, the Examiner notes that Smith teaches determining mud pressure and considers this to be a "subsurface characteristic." She admits that Smith does not teach detecting a subsurface geologic characteristic, but considers Barber to teach this. She concludes that it would have been obvious to one of ordinary skill in the art to use Smith's apparatus to determine a geologic characteristic, as taught by Barber. She contends that the advantage of this would be to measure formation depletion.

Applicant disagrees. The Examiner has not produced a *prima facie* case for obviousness, as the prior art simply does not provide any impetus to do what the inventors have done in this case. In fact, the modifications that the Examiner proposes would be unobvious since they would change the principle of operation of the modified device. See MPEP §2143; In re Ratti, 270 F.2d 810 (CCPA 1959). In this case, the Examiner's proposed modification would materially change the basic principle of operation of Smith. As noted previously, Smith describes an alarm and telemetry system that is designed to detect a condition within a wellbore, such as an increase in mud pressure that might lead to wellbore kick, and then transmit this information to a remote receiver. In fact, Smith's device is only actuated by the release of an unusual amount of a formation fluid, such as

gas. See Smith, col. 8, lines 65-67. If Smith's device with modified to serve as a geologic, seismic exploration tool (like Barber's), it would change the basic principle of operation for Smith's device, rendering it unsuitable for use as an alarm, at least because the device would not be actuated only upon the release of an unusual amount of formation fluid.

There is no teaching or suggestion present in the art to use Smith's device to transmit a signal useful for seismic exploration, of the variety discussed in Barber. The Examiner's stated motivation -- i.e., to measure formation depletion, is only apparent in hindsight, after benefit of the Applicant's disclosure. There is not suggestion within the art itself to use Smith's telemetry alarm system as an instrument for obtaining geologic seismic information, such as formation depletion.

In fact, the references teach against combining Smith and Barber, and indicate that this sort of combination might be unworkable. Barber, unlike Smith, teaches placement of offshore seismic sources (3) at a great distance above the surface of the geologic formation to be explored. Specifically, Barber recommends that the seismic sources (3) be located "below the water surface at a predetermined depth of between about one to four meters." Barber, col. 2, lines 40-41. Barber teaches that this high placement is important to "minimize reflection of ghost echoes and bubble pulsation." Col. 6, lines 32-36. Applicant submits that one of skill in the art, having knowledge of Barber's teachings would not be motivated to utilize a downhole anchor as a seismic source, as with the claimed invention, since this would result in ghost echoes and bubble pulsation. At the very least, Barber's teachings suggest that such an arrangement would result in such problems and, perhaps, be unsuitable for its intended purpose of geologic seismic exploration.

Rejection of Claims 1-8, 12, 13, 15-17, 23, 24, 26 and 33-36 under 35 USC §103(a) over Smith, Cretin and Barber

Claims 1-8, 12, 13, 15-17, 23, 24, 26 and 33-36 stand rejected for obviousness over a combination of the Smith, Cretin and Barber references. As Applicant understands the rejection, the Examiner considers Smith to teach each of the elements of these claims with the exception of 1) an anchor device engaged with the borehole at a selected location and 2) determining a subsurface geologic characteristic. However, she finds Cretin to disclose an anchor device engaged with a borehole and Barber to teach determining a subsurface geologic characteristic. She concludes that it would have been obvious to one having ordinary skill to modify Smith's device to make the anchor device engaged with the borehole, as taught by Cretin. The advantage, the Examiner contends, would be to secure fastening of the apparatus to the borehole while seismic energy is being transmitted.

Applicant traverses the rejection. First, Applicant incorporates herein the arguments made previously with respect to the impropriety of combining the Smith and Barber references. Applicant further submits that it is improper to combine Smith and Cretin in the manner that the Examiner has done. Cretin describes a static seismic system wherein a probe 8 is suspended within a borehole and anchored against one wall of the borehole by a mobile arm 10. See Cretin, col. 3, lines 55-60 and Figure 1. This arrangement is suitable for a seismic prospective operation (see, e.g., col. 1, line 49- col. 2, line 18) after a borehole has been drilled. However, it is not suitable for use during drilling, which is what Smith's arrangement is used for. Applicant submits that it would be infeasible to dispose Cretin's anchored probe within the borehole because the drilling string containing Smith's device would occupy the borehole.

Rejection of Claims 9-11, 14, 25, and 27-32 under 35 USC §103(a) over Smith, Cretin, Barber and Nelson

Claims 9-11, 14, 25, and 27-32 stand rejected for obviousness over a combination of the Smith, Cretin, Barber and Nelson references.

Applicant traverses the rejection. Applicant incorporates herein the arguments made above with respect to independent claims 1, 12, and 23 and Smith, Cretin and Barber to render these claims unpatentable. Applicant submits that claims 9-11, 14, 25, and 27-32 should be patentable at least as depending from allowable base claims.

Conclusion

The Commissioner is hereby authorized to charge any fees deemed necessary for this response to **Deposit Account No. 02-0429 (284-15718-USCE)** maintained by Madan, Mossman & Sriram. The Examiner is invited to discuss this matter with Applicant's attorneys should any questions arise.

Respectfully submitted,

Dated: March 31, 2004



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